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THE MANUFACTURING MANAGEMENT OFFICER'S HANDBOOK(U) AIR
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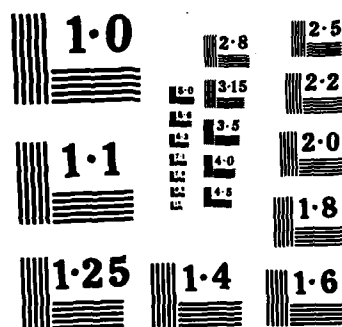
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STUDENT REPORT

THE MANUFACTURING MANAGEMENT OFFICER'S
HANDBOOK

MAJOR JAMES P. DWYER

85-0730

"insights into tomorrow"

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REPORT NUMBER 85-0730

TITLE THE MANUFACTURING MANAGEMENT OFFICER'S HANDBOOK

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Submitted to the faculty in partial fulfillment of
requirements for graduation.

**AIR COMMAND AND STAFF COLLEGE
AIR UNIVERSITY
MAXWELL AFB, AL 36112**



UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED			1b. RESTRICTIVE MARKINGS		
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION/AVAILABILITY OF REPORT		
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE					
4. PERFORMING ORGANIZATION REPORT NUMBER(S) 85-0730			5. MONITORING ORGANIZATION REPORT NUMBER(S)		
6a. NAME OF PERFORMING ORGANIZATION ACSC/EDCC		6b. OFFICE SYMBOL (If applicable)		7a. NAME OF MONITORING ORGANIZATION	
6c. ADDRESS (City, State and ZIP Code) MAXWELL AFB, AL 36112			7b. ADDRESS (City, State and ZIP Code)		
8a. NAME OF FUNDING/SPONSORING ORGANIZATION		8b. OFFICE SYMBOL (If applicable)		9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER	
8c. ADDRESS (City, State and ZIP Code)			10. SOURCE OF FUNDING NOS.		
			PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.
11. TITLE (Include Security Classification) THE MANUFACTURING MANAGEMENT OFFICER'S					
12. PERSONAL AUTHOR(S) DWYER, JAMES P., MAJOR, USAF					
13a. TYPE OF REPORT		13b. TIME COVERED FROM _____ TO _____		14. DATE OF REPORT (Yr, Mo., Day) 1985 APRIL	
				15. PAGE COUNT 65	
16. SUPPLEMENTARY NOTATION Item 11: HANDBOOK (U)					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB. GR.			
19. ABSTRACT (Continue on reverse if necessary and identify by block number) <p style="text-align: center;"><i>Handbook</i></p> <p>This handbook is oriented primarily for the Manufacturing Officer career field. It serves as a single source reference document providing information the Manufacturing Officer needs to be knowledgeable of concerning Systems Program Office (SPO) responsibilities. The handbook is designed to be both educational for the newcomer in the career field as well as to serve as a refresher for those with more experience.</p>					
20. DISTRIBUTION STATEMENT (If Abstract)				21. ABSTRACT SECURITY CLASSIFICATION	
UNCLASSIFIED (UNLIMITED) [] SAME AS RPT [X] DTIC USERS []				UNCLASSIFIED	
22a. NAME OF RESPONSIBLE INDIVIDUAL ACSC/EDCC MAXWELL AFB, AL 36112				22b. TELEPHONE NUMBER (Include Area Code) (205) 293-2483	
				22c. OFFICE SYMBOL	

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PREFACE

Over the past few years the area of manufacturing has received expanded emphasis within the Air Force. From Air Force Systems Command, the Executive Report entitled "PAYOFF 80" highlighted some recommendations which basically said that manufacturing must be considered early on in the life-cycle of a program. To ensure that this early involvement is effective there are a number of manufacturing requirements which must be identified and planned for by the Program Manager and specifically his Manufacturing Officer.

I came into the 6524 Manufacturing Career Field in 1980 when the PAYOFF 80 recommendations were being implemented. With no prior experience in the career field I found it hard to identify my Systems Program Office (SPO) responsibilities. Sure I was able to pick up bits and pieces of information as my knowledge base expanded. However, the initial few months would have been smoother if a single source document had existed which pointed out some of the basics.

As a supervisor, I saw new personnel asking the same questions that I had asked before and in some cases were spinning their wheels looking for an answer. On more than one occasion I was asked if there was a good basic source of information that a Manufacturing Officer could use. The answer was always NO!

As Chief of the Manufacturing Operations Division at Space Division I saw the experience level of our Manufacturing Officers decreasing as we were getting recent college graduates with no practical experience. Based on discussions with my successor and the Director of Productivity at Space Division the need for a handbook which would identify areas a SPO Manufacturing Officer should be concerned/involved with became more evident. The handbook would also help answer in the affirmative that there is a basic source of information for the new Manufacturing Officer.

In putting this handbook together I drew upon my three years of experience as the Manufacturing Officer for the Inertial Upper Stage SPO and one year as Chief of the Manufacturing Operations Division at Space Division. Some of the topics have specific references which you can use to get additional information and guidance. Other areas are based only upon my experience. As a new Manufacturing Officer you should consider the advice contained in this handbook, but also talk with one of the "old heads" in your organization to get a second opinion. That additional advice could preclude a headache based on your unique situation.

It is the hope of the author that this handbook will also be useful to other Product Divisions within AFSC. But remember my experience base is only with Space Division. Take this handbook and build upon it to meet your own needs.

CONTINUED

I would like to acknowledge a number of people who contributed to this handbook. First special credit goes to the excellent assistance provided by my academic advisor Major Barry Britton (ACSC/EDCW). His advice and editing skills helped pull this handbook together. A special thanks goes to Mr. Bill Briggs, GS-15 and Major Rick Franke for taking time out of their busy schedules at Space Division to provide me comments and additional information which were incorporated into this handbook. Finally, the typing and proof-reading skills of Joan Philips are greatly appreciated.

ABOUT THE AUTHOR

Major James P. Dwyer received his Bachelor of Business Administration from the University of Hawaii in 1970. He was commissioned through the Officer Training School Program in 1971 prior to going to Undergraduate Navigator Training (UNT) at Mather AFB. After graduating from UNT he was assigned to CCK Air Base (AB), Taiwan flying C-130E's. In 1973, he moved to Clark AB, Republic of the Philippines where he served as an Instructor Navigator and scheduling officer in the 21st Tactical Airlift Squadron (TAS). Then in 1975 he was transferred to Yokota AB Japan where he upgraded to Flight Examiner in the 345th TAS. In 1979, he was selected for the Education With Industry (EWI) Program and spent 10 months with Northrop Corporation's Aircraft Division in Los Angeles, California. At the completion of the EWI program he was reassigned to Headquarters Space Division (SD) Los Angeles AFS, as a Manufacturing Officer in the Inertial Upper Stage (IUS) Program Office. There he was responsible for the manufacturing activities, for both the Full-Scale Development and first Production Contract. During this period he received a Master of Science degree in Program Management from West Coast University. In 1983 he became Chief of Manufacturing Operations Division at SD. Major Dwyer graduated from Squadron Officers School in 1975 and was selected to attend Air Command and Staff College (ACSC) at Maxwell AFB in 1984.

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Chapter One

INTRODUCTION TO MANUFACTURING MANAGEMENT

INTRODUCTION

Welcome to the world of manufacturing. It is most likely that you have one of the following Air Force Specialty Codes: 6521, 6524, 6541, 6544, 6511, or 6516 and if not thank you for taking the time to learn more about the area of manufacturing management.

Webster's Dictionary says that manufacturing is the process of transforming raw materials into a product suitable for use according to an organized plan and with a division of labor. From this definition you can see there is a structured process that must be followed before the end product is ready for use. To indicate control over the manufacturing process the word "management" is added. In AFM 800-9 manufacturing management is concerned with the early and continuous planning, analysis, and direction required to ensure the efficient production of hardware as well as adequate post-production manufacturing support.

As the Systems Program Office (SPO) Manufacturing Manager/Engineer you're responsible to the SPO Director to ensure necessary planning, analysis and coordination has been completed so the manufacturing process defined by Webster flows smoothly. You may be saying, "This sure sounds like a lot of Mom and Apple Pie, but not much on how I'm going to get this job done." And you are right! Don't give up hope, just read on.

PURPOSE OF THIS HANDBOOK

It is intended that this handbook serve as a single reference document to get you out of the starting blocks when you aren't sure where to turn to next. You will be exposed to various terminologies used in manufacturing management with a brief discussion upon which you can build your knowledge base. By no means are all the answers given or areas covered. You can add to this handbook as your experience level expands. Too, this handbook shouldn't be looked upon as only for the new guy in the office. Those of you with a wealth of experience in the career field can use it as a refresher.

A PREVIEW OF WHAT'S AHEAD

Chapter 2 serves as a starting point by establishing the Air Force Policy on manufacturing management. Along with the "why", you are challenged to outline your responsibilities as a manufacturing manager/engineer. These responsibilities need

to be communicated to the SPO so they know where you fit in and what you can do for them.

Chapter 3 will develop the baseline for your manufacturing planning. It will focus on areas needing your attention early in the program.

Chapter 4 will look at some producibility considerations that will be helpful in working with the contractor. The areas noted should allow you to drive a stake in the heart of the adversary relationship that sometimes develops between the contractor and SPO. The key is to work as a team and this is a good place to start.

Chapter 5 gets into some of the contractual and pre-contract-award requirements you should know about. Depending upon the type of contract written for the program, your list in this area could get larger. Some good advice would be to work closely with the contracting officer so you know what type of inputs are needed.

Chapter 6 talks about some of the sustaining manufacturing tasks that will need your attention. In most cases these aren't time consuming efforts, but if overlooked could get you an invitation to the SPO Directors Office to explain why something went wrong.

Chapter 7 signals we're at the end of this handbook. Some final reflections and thoughts are presented that will hopefully finish off the foundation this handbook has built. Now it is time for you to put the framework around your program's manufacturing requirements so the finished product works as advertised.

Now that you are ready Chapter 2 is on the next page!

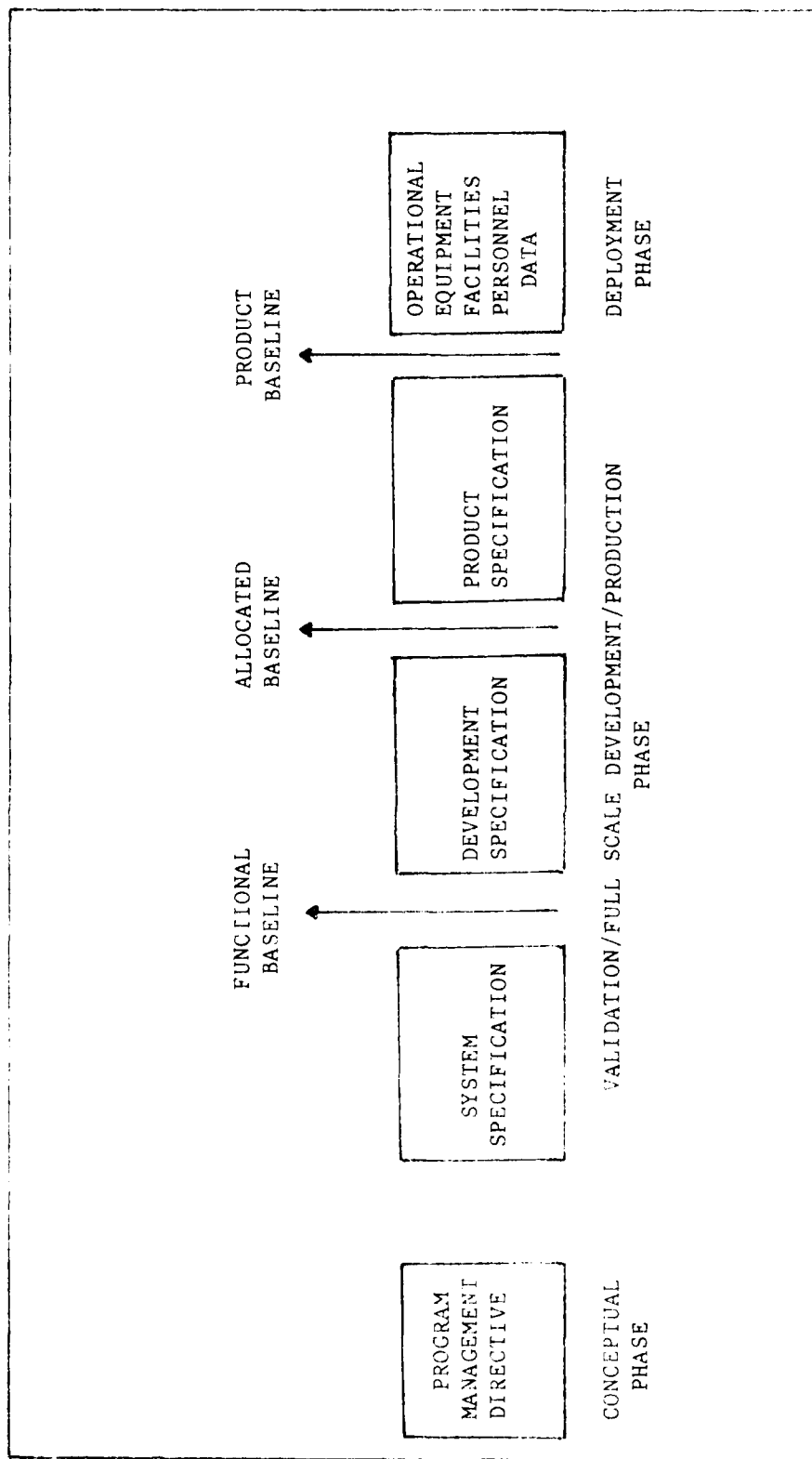


Figure 2. SIMPLIFIED PRODUCT BASELINE LIFE CYCLE

5) Used to document functional requirements (Performance, Operations, Logistics, Training, etc.).

Allocated Baseline. This establishes written specifications for each of the CI's major systems and critical components. It also establishes qualification test requirements for CI systems and critical components.

- (1) CIs are identified within the system.
- (2) CIs are allocated performance requirements.
- (3) Allocated baselines are established prior to or after the PDR.

Product Baseline. This represents the final physical design of a system and its components.

- (1) Consists of final production, process, and material specifications.
- (2) Established just prior to or during the PCA. Each of these baselines and their relationship are noted in Figure 2.

For more detailed information you should refer to MIL-STD 1521A and then stop by to talk with your local configuration management personnel. If you can, try to get a copy of Space Division's (SD) Tips For More Productive Reviews, dated June 1981, it has some good pointers you can use.

(3) Identify characteristics and compatibility of the physical and functional interfaces among CI's and other items of equipment, facilities, computer programs, and personnel.

(4) Plans for continued development testing will also be reviewed.

Critical Design Reviews (CDR)

The objective of this review is to address each CI when the detail design is essentially complete. The purpose of this review will be to:

(1) Determine that the detail design of the CI under review satisfies performance and engineering specialty requirements of the CI development specifications.

(2) Establish the detail design compatibility among CIs and other items of equipment, facilities, computer programs and personnel.

(3) Assess producibility and CI risk areas (on a technical, cost, and schedule basis).

(4) Review preliminary product specifications.

In addition to the above reviews, you as the Manufacturing Officer will be a participant in the Physical Configuration Audit (PCA).

Physical Configuration Audit (PCA)

The objective of this audit is to examine the as-built version of the end-item against all technical documentation to ensure adequate producibility characteristics are evident.

(1) A PCA shall review drawings and manufacturing instructions sheets to insure the instructions accurately reflect design details.

(2) The audit goes to the level of materials, special instructions, dimensions, tolerances, finishes, and processes.

Functional Configuration Audit (FCA)

Another audit you could be asked to support is the FCA. The FCA is to measure a contractor's compliance with the development specifications and test plans to verify that each CI's actual performance complies with its Part I Development Specification.

As you go through these Reviews and Audits you will hear reference to the following terms.

Functional Baseline. Defines all necessary systems requirements in terms of performance and physical constraints as well as functional requirements and interfaces.

(1) Describes the essential requirements for basic functional elements of a system.

(2) Normally established at the end of the conceptual phase.

Chapter Four

PRODUCIBILITY CONSIDERATIONS

Topics in this chapter will help you focus attention throughout the program on ways to ensure design producibility isn't an afterthought. Producibility can be enhanced by either modifying the item design or improving the manufacturing process. You as the manufacturing officer need to lead the producibility crusade, be it through a design review or use of value engineering techniques. We'll first look at the various reviews a system will be exposed to.

REVIEWS AND AUDITS

Military Standard 1521A Technical Reviews and Audits for Systems, Equipment, and Computer Programs, identifies design reviews to be conducted during the life-cycle of a program. The Manufacturing Officer needs to be a key participant in the following reviews focusing in on the manufacturing needs of the Program.

System Requirements Review (SRR)

The SRR is a means to evaluate a contractor's responsiveness to the SOW and to ascertain his efforts in defining system requirements. It is conducted when a significant portion of the system functional requirements have been established. Trade-off studies, risks and cost analysis are also addressed.

System Design Review (SDR)

This review is conducted to evaluate optimization, correlation, completeness, and risks associated with the allocated technical requirements. Included is a summary review of the system engineering process which produced the allocated technical requirements and the engineering planning for the next phase of the program. This review is conducted when the system definition effort has proceeded to a point where system architecture are defined and configuration items (CI) are identified.

Preliminary Design Review (PDR)

This review is conducted for each CI or aggregate of CI's (System/Subsystem) to:

1. Evaluate progress, technical adequacy, and risk resolution (on a technical, cost, and schedule basis) of the selected design approach including producibility and manufacturing considerations.

2. Determine its compatibility with performance and engineering specialty requirements of the CI development specification.

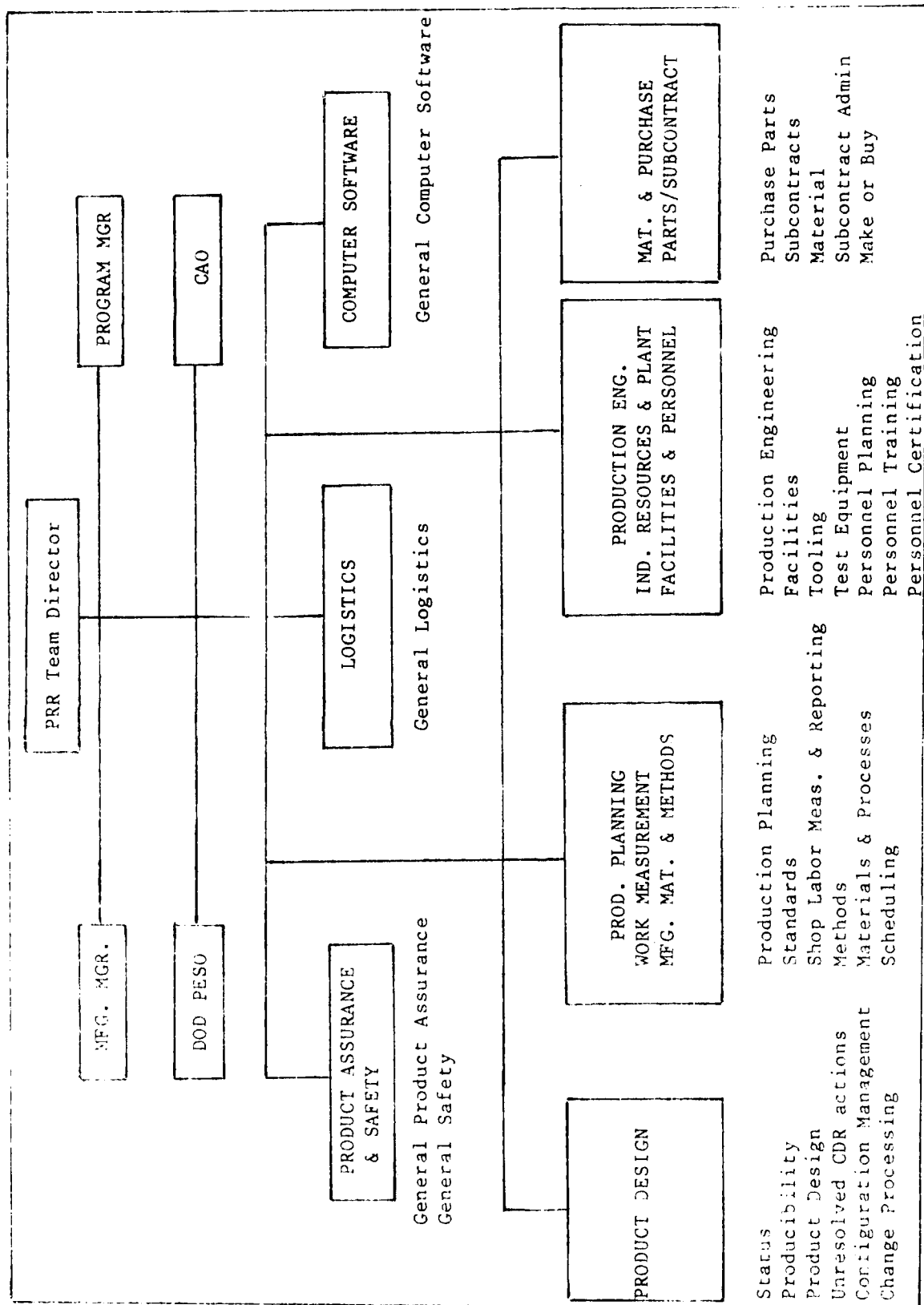


Figure 1. Sample PRR Team Organization

Manufacturing personnel. They all can provide valuable inputs to help you with this task. The following expanded index is provided to help you get started in putting your plan together. This index is a combination of what was used on the Inertial Upper Stage and Anti Satellite Programs at Space Division.

Sample PRR expanded index

- . Introduction
 - What system is involved
 - Purpose of the PRR
 - Objective of the PRR
 - Authority (contractual requirement)
 - Applicable Documents (i.e. AFSC Regulation 84-2)
- . Responsibilities of Participating and Supporting Organizations
 - Team Director
 - Panel Chairmen
 - Panel Members
 - Advisors
- . Team Composition
 - Identify the various panels (See Figure 1)
 - Assign team members to a panel
- . Review Criteria
 - See AFSC Regulation 84-2 paragraph 15
- . Schedule of Reviews
 - Prime Contractor
 - Subcontractors
- . Sample Agenda
 - General Overview Briefing
 - Panel Reviews
 - Government Caucus
 - Government present recommendations, action items, and concerns to the contractor
 - Prime Contractor presents recommendations, action items, and concerns to the subcontractor
 - General discussion to agree on conclusions and recommended actions
 - Out-briefing by the Government Team
- . Documentation
 - Establish the forms which will be used by the panels to note recommendations, action items, and concerns
 - Format for PRR Reports (See AFSCR 84-2 Attachment 2)

Next in Chapter 4 you will look at Producibility as a consideration. Some of the various methods used to deal with this subject are discussed. Press On!

for any special requirements you feel would be of benefit. The most important thing is to work with your CAS point of contact to determine what additional information could be provided. By pre-coordinating your agreement, your section of the MOA won't run into any road blocks. A sample MOA for Manufacturing Operations can be found in Appendix A. This sample MOA was for a program with a Criticality Designator of "A". Needs of your program will determine if this amount of detail is needed. Note that it includes duties for both the AFPRO and SPO Manufacturing personnel.

PROGRAM OFFICE STAFFING (MANUFACTURING PERSPECTIVE)

The objective of this function is to identify and provide your SPO with the necessary resources to manage the Manufacturing Management Office functions. To a large extent this will be governed by your product division's tasking and contract requirements.

As a planning necessity, you must identify any SPO manufacturing needs and then schedule related tasks to meet those specific needs. If any task requires expenditure of program funds, i.e. to support TDY requirements, an associated estimate would need to be provided the SPO financial manager. This estimate could be as simple as the number of people (times) the number of days (times) the per diem rate (equals) so many dollars.

An example of a manufacturing need is a Production Readiness Review (PRR) which will be discussed next. You would need to work with your contractor to identify dates, times, places, personnel (both contractor and government) and agenda just for starters. This type of effort requires months of planning and coordination so get started early and if you need more help in getting the job done talk to your Director of Manufacturing as early as possible. Also, check with one of the more established programs at your product division, they've gone through this same song and dance you are about to conduct.

PRODUCTION READINESS REVIEWS (PRR)

A PRR is a formal review to determine whether a system or product under development is ready for efficient and economical quantity production; important production engineering problems encountered during development have been resolved; and the contractor has accomplished adequate planning for production. A PRR will provide program management with quantitative information to ensure that the production decision does not incur unacceptable risk in terms of cost, schedule, or system performance.

AFSC Regulation 84-2 provides the necessary authority and guidance for conducting a PRR. It is important to ensure there is a specific statement of work (SOW) requirement included in the prime's contract with proper flow-down requirements noted for any subcontractors which also require a PRR.

You will be responsible for developing the Production Readiness Review Plan which serves as the cornerstone for an effective review. AFSC Regulation 84-2 provides the general guidance, sample contractual language, evaluation criteria, and report format. Before you put pen to paper make sure you have talked with the Program Manager, Director of Manufacturing, CAS, Contractor and your fellow

More detailed information can be provided by your local Configuration Management personnel. Also the following Military Standards (MIL-STD) should be of assistance:

- . MIL-STD 480 and MIL-STD 481 cover configuration control and establish requirements for submittal of engineering change proposals (ECP), deviations, and waivers.
- . MIL-STD 482 provides guidance on configuration management status accounting.
- . MIL-STD 490 covers specification practices.

As part of the Configuration Management process a number of reviews and audits are conducted which will be covered in Chapter 4. Another major activity of CM is the Configuration Control Board (CCB) which process all of the ECP's, Deviations, and Waivers for a program. Each CCB is normally chaired by the Program Manager with representatives from engineering, contracting, manufacturing, test and evaluation, logistic support, training, program control, and configuration management. Each of these functions provides a recommendation to the Program Manager on the soundness of the proposed contractor action.

As a manufacturing officer you need to review/evaluate each ECP, Deviation and Waiver to determine its affect on the manufacturing process. Where new man-hours are proposed you need to determine their reasonableness. In doing this you work with the contractor's implant Government personnel (AFPRO or DCAS), and other disciplines within the SPO. Your recommendation should be written and coordinated with the SPO's Office of Primary Responsibility (OPR) prior to the CCB meeting. Check with your local Configuration Management shop as they might have pre-printed forms on which you can make your recommendation.

The key is to be involved and by knowing what changes are proposed you can better keep track of program activities. Any manufacturing expertise you provide in this area will be welcomed by the Program Manager.

CONTRACT ADMINISTRATION SERVICE (CAS)

Basic CAS functions can be found in Defense Acquisition Regulation (DAR) 1-406 or the newer Federal Acquisition Regulation (FAR) 42.3 depending upon which regulation your contract was written against. The contract criticality designator will determine what support you can expect from a Contract Administration Office (CAO). The Program Office needs to determine the amount of support required and then assign a proper designator.

In addition to the general functions noted in the above procurement regulations, most program offices establish a Memorandum of Agreement (MOA) with their supportive CAS office which could be one of the following:

- . Air Force Plant Representative Office (AFPRO)
- . Navy Plant Representative Office (NAVPRO)
- . Army Plant Activity
- . Defense Contract Administration Services (DCAS)

As part of the MOA you could include a section on Manufacturing Management

control, and the SPO Integration and Logistic Support (I&LS) personnel.

WORK MEASUREMENT

Work measurement standard, (MIL-STD 1567), was first developed in the early 1970's as a means to reduce costs of acquiring new systems. MIL-STD 1567 is intended to assist in achieving increased discipline in a contractor's work measurement program with an objective of improved productivity and efficiency in his industrial operations. The standard requires for a contractor to develop "should take" times for operations involving touch labor and to use this information in developing specific standards for planning, scheduling, and controlling work loads. As a management tool to improve productivity, MIL-STD 1567 is required on:

- . Full-Scale Development programs exceeding \$100 million.
- . Production programs exceeding \$20 million annually or \$100 million cumulatively.
- . Subcontracts exceeding \$5 million annually or \$25 million cumulatively.

You should be aware that industry's reaction to MIL-STD 1567 hasn't been that positive. Their objections have been voiced through the Council of Defense and Space Industry Association (CODSIA) and have focused on the reporting accuracy requirements; using labor standards for estimating both changes and new proposals; and flowdown requirement to subcontracts when the dollar threshold is met.

When looking at work measurement in addition to MIL-STD 1567 you should also consult the following documents:

- . AFR 800-9
- . AFSCR 800-9
- . Defense Systems Management College Manufacturing Management Handbook for Program Managers, Jan 1982

In dealing with work measurement, you must also have a working knowledge of learning curves in order to evaluate contractor data. An excellent source of advice would be one of the experienced Industrial Engineers in your organization. Another useful source that you can keep on your bookshelf is the following book:

United States Army Missile Command, Directorate of Procurement and Production. ALPHA and OMEGA and The Experience Curve. Redstone Arsenal, Alabama. undated.

CONFIGURATION MANAGEMENT (CM)

Configuration management spans the entire life cycle of a system. The actual configuration management process involves both technical and administrative direction and surveillance to:

- . Identify and Document functional and physical characteristics of a configuration item
- . Control changes to those characteristics
- . Record and report change processing and implementation status

For more detailed information refer to Data Item DI-P-3460.

COST/SCHEDULE CONTROL SYSTEM CRITERIA (C/SCSC)

The C/SCSC specifies the capabilities that a contractor's internal planning and control system must possess to be acceptable for government contracts. C/SCSC basic concept of establishing and maintaining a plan against which to measure actual accomplishments requires a contractor to (1) define the work, (2) assign the work to a functional organization, (3) establish internal plans, schedules and budgets and (4) compare actual cost and schedule performance against these plans, schedules and budgets. But how do you read and evaluate all these numbers?

Find out who in program control monitors your contractor's C/SCSC system and have them explain the various reports received each month. Also, during your next visit to the contractor's facility meet with the Government Plant Representative's Office C/SCSC monitor for any additional clarification you might need.

From a manufacturing perspective you will want to concentrate your monthly review on the fabrication and assembly labor, manufacturing engineering, tooling, facilities, and material which should all be reported in terms of costs and man-hours. By comparing actual costs to date with the total budget for work completed, the contractor will be able to identify any cost variances. As the manufacturing officer you should understand why a particular variance is being reported and what corrective action is being taken to get back on track.

You will find that a working knowledge of cost and man-hour relationships for various manufacturing activities will pay off during future proposal evaluations. Work with the contractor to get any data you need to track the program. In most cases the contractor has the data and it's yours for the asking. However, make sure any special requests aren't taken as contract direction for which an additional cost could be incurred.

DESIGN TO COST/LIFE CYCLE COST PROGRAM (DTC/LCC)

The term "Design to Cost" means the management and control of future acquisition, operating, and support costs during the design and development process under established and approved cost objectives. In looking at "Life Cycle Cost" there are three distinct phases for any system for costing purposes (1) research and development, (2) procurement (production), and (3) operation.

Cost objectives (goals) are established for production and operations during development of the PMD and AFSC Form 56. Along with cost objectives, performance targets are established which are monitored throughout the program's life cycle.

As a Manufacturing Officer you need to review and analyze the manufacturing costs which are used as part of these cost models. You must insure that they reflect current manufacturing needs and take proper account of any manufacturing technology improvements which could be incorporated into your program.

The people you will be working with can provide further guidance on what is required. Your point of contacts should be the program's financial manager, program

Manager.

PROGRAM MANAGEMENT PLAN (PMP)

This document is developed early in the program life-cycle by a Systems Program Office (SPO) under the direction of a Program Manager (PM). This plan describes program objectives as well as the integrated time-phased activities and resources required to complete tasks specified in the PMD. The basic management approach and roles/support required from other organizations will be identified. You will find the PMP is tailored to the specific needs of each program. The PMP is approved and issued by the PM to provide higher headquarters with the SPO's planned approach for satisfying program direction included in the PMD and AFSC Form 56.

As the Manufacturing Officer you want to insure all necessary requirements from AFR 800-9 and AFSCR 800-9 are identified in the PMP. The PMP, as a minimum, should be reviewed annually to make any necessary updates and to ensure you are working according to plan. Try the same sources for the PMP that you did for the PMD.

PRODUCTION PLAN

A production plan may be requested from a prime contractor as part of the Full Scale Development contract Request for Proposal. Contractors will build a production plan to show their ability to plan, control, fabricate, assemble, inspect, test and deliver acceptable hardware/support on schedule and within cost using existing facilities, manpower, and resources to the maximum extent possible. The contractor's plan should show all required time phased production actions necessary for delivery of each contractual end item. Production plans address not only complete systems but Government Furnished Equipment as well.

One of your responsibilities as the SPO's Manufacturing Officer is to review Data Item DI-P-3460 which details requirements of a production plan and to tailor it accordingly for your program. You will be tasked later to review the Production Plan itself, and document your comments and concurrence/nonconcurrence in a letter to the SPO Contracting Officer (the contractor also gets a copy).

Below are some major areas you would expect to see in a generic Production Plan:

- . How the Manufacturing Organization is structured
- . Make or Buy Approach
- . Subcontracting Controls
- . Industrial Facilities which will be used
- . Special Tooling/Special Test Equipment Requirements
- . Assembly, Installation and Checkout Flow
- . Manpower Requirements
- . Manufacturing Methods and Processes
- . Producibility Considerations
- . Production Schedules
- . Management Systems

Chapter Three

MANUFACTURING PLANNING

This chapter will address some of the areas you need to dig into when first assigned to a program. You will see that the topics discussed aren't restricted only to manufacturing. The objective is to point out that manufacturing can't be considered in isolation and that you need to know about program management direction, cost control system, configuration management, etc., to have a better understanding of your program. After looking at each of the following topics and the specifics noted in your program you should have a good picture of where the program is going and some of the early manufacturing planning you need to do. To begin with let's look at the Program Management Directive.

PROGRAM MANAGEMENT DIRECTIVE (PMD)

The PMD is issued by HQ USAF after a Statement of Operational Need (SON) and a Mission Element Need Statement (MENS) have been validated by the Secretary of Defense (SECDEF). The PMD directs implementing and participating commands by providing program guidance and direction so that their respective responsibilities can be established. It is used during the entire acquisition life-cycle of a program and revised frequently to refine requirements. Also, it will note policy decisions which pertain to funding and documentation needs.

You will find the PMD includes a statement of the program's specific purpose, a summary of the program, and guidance for the program management function. Also, there will be a list of reference documents requiring compliance by the Program Office and a brief discussion of program milestones that are to be achieved during the acquisition phases.

Within Air Force Systems Command (AFSC) the PMD is implemented by an AFSC Form 56 sent from HQ AFSC to the appropriate product division. In most cases the product division has been afforded the opportunity to make inputs to HQ AFSC which could affect both the PMD and Form 56 they will be working with. Some possible manufacturing considerations are noted below.

As the manufacturing officer you will want to look at the cost and schedule reporting thresholds; note the responsibilities and interrelationships of the various participating organizations; and identify all the production regulations, manuals, and specifications that are required for the program.

If you find yourself assigned to a program office that is well established you still want to review the most recent PMD and AFSC Form 56 in order to get the big picture. To get copies, the two offices you should try first would be Program Control or the Contracting Office. If neither of these offices have a copy ask your Program

Industry saw the need for early involvement by the manufacturing department, prior to completion of engineering drawings. Through this early integration of engineering and manufacturing numerous problems were solved early in the design cycle. These solutions can be projected into the production phase as a reduction in redesign effort, thus saving time (schedule) and dollars.

This same type of early involvement by the manufacturing personnel in the SPO is also needed. The goal of AFR 800-9 is to efficiently and effectively manufacture and support Air Force systems and to reduce cost and lead time by the management of production resources. Manufacturing personnel must consider this goal throughout the life-cycle of Air Force development and acquisition programs with special emphasis on the planning and early development efforts. The key is to become part of the SPO team early.

INFORMING THE SPO

As a way of educating the SPO personnel on what your responsibilities are, after reviewing AFR 800-9, sit down with AFSCR 800-9 and your product division supplement and outline your duties. These are the things that you can do for the SPO. Once your list is built you need to run it by the SPO Director and his staff to see where they need the most help (in Chapters 3-6 various specific areas will be addressed). As the manufacturing manager, you should be a member on the SPO Director's staff just as engineering and contracts are. Staff meetings are excellent opportunities to pass out and discuss background papers describing aspects of your function. This educational process can do wonders to get you involved in the day to day activities within the program office. Now that your foot is in the door you need to produce!

As your overall objective you should keep this in mind: Try to minimize and clearly identify all the risk associated with the manufacture and the production of a system. You say, "Boy is that a big job" and it is; you have a major responsibility to the SPO. This isn't a one man show, so of course, you will need help. Talk to the "old heads" in your product division's manufacturing organization. They can help you establish contacts you will need along the way. As you keep the above objective in mind you will need to be able to analyze each contractor's facility, various processes, work procedures, and design requirements as they apply to your program. As you gain experience the answers tend to come easier.

To help establish that experience base Chapter 3 looks at some manufacturing planning considerations you need to keep in mind. Areas identified aren't all-inclusive and you should expand upon them so when the new guy comes to you you can get him started on the right foot too.

Chapter Two

WHY MANUFACTURING MANAGEMENT

We'll take a look at the primary Air Force guidance for manufacturing policy as it pertains to Air Force Systems Command. Next, based on this author's experience, you will be exposed to the increased emphasis which has been directed at manufacturing from Air Staff down to the Program Office. In order to keep this interest level up in the Systems Program Office (SPO) you as the Manufacturing Officer will be challenged to identify your responsibilities to the Program Manager. This entire handbook will help familiarize you with what those responsibilities are. First let's look at the "WHY" behind manufacturing management.

BACKGROUND INFORMATION

As a starting point, AF Regulation 800-9 establishes the Air Force's policy on manufacturing management. This policy encompasses the acquisition and contract support of major systems, subsystems, or equipment as designated under DOD Directive 5000.1 or by the Secretary of the Air Force (or a designee). The Major System Acquisitions as outlined in DOD Directive 5000.1 is now implemented by AFR 800-2 with the former now being attachment 1. As a new guy on the block (old heads aren't excluded) the above regulations and directive would serve as an excellent starting point in understanding the need for manufacturing management. In addition look at AFSCM 800-9 for a brief review of why the increased emphasis on manufacturing management.

However, there is not 100 percent across the board application of AFR 800-9. For those programs not identified as a major systems acquisition the applicability of AFR 800-9 should be considered if any manufacturing is involved. The manufacturing manager within the SPO will determine the extent to which this regulation applies and then recommend the selective application where appropriate to avoid unnecessary costs. Help in making this determination can come from your Manufacturing Division, Government Plant Representative Office located at the contractor's facility, and the friendly folks at Headquarters Air Force Systems Command. All that is needed is a willingness to ask for their assistance.

EMPHASIS ON MANUFACTURING MANAGEMENT

Since the early 1980's emphasis on manufacturing management has improved greatly. Previously, manufacturing from an Air Force perspective was looked upon as an after thought, the same had been true in industry. After engineering drawings were completed, manufacturing was expected to build the item as designed. In many cases the design and the ability to produce weren't compatible. How could this problem be corrected?

PARTS, MATERIALS AND PROCESS (PMP)

The objective of PMP program is to provide necessary control over parts and materials processes which are used to manufacture many of today's DoD complex systems. The extreme environmental conditions such as temperature, vibration, and vibration to which these systems operate, i.e. a satellite, require that only qualified high reliability PMP be utilized. By controlling the PMP this allows for confidence in end-item pedigree and reduces the number of specifications which must be controlled.

Selection of the PMP is an important and fundamental consideration during the design phase. Design engineers must consider design characteristics as well as productivity requirements when selecting various PMP.

When you go to the AEC will normally find PMP under the Systems Effectiveness Department. As a Manufacturing Officer you want to insure this area is evaluated during the production readiness Review. Areas you want to have covered are:

1. Have all critical and high risk parts been identified?
2. Have all non-standard parts approvals been submitted and approved by the AEC PMP control board?
3. Is there an effective working relationship between production management and purchasing concerning stated PMP controls?
4. Have all critical and high risk materials and processes been identified?
5. Have all processes been proven?
6. Have adequate process controls been applied; e.g. soldering, welding, plating, etc.?
7. Do the operators of these special processes have current certifications?

Speak by Systems Effectiveness as they can provide much more detailed information concerning this area.

MANTECH, TECH MOD, IMIP

Before you start looking for help, each one of these acronyms will be discussed and I'll first a little background.

Traditionally faced with a limited budget, increasing equipment requirements, and increasing acquisition costs the Department of Defense (DoD) initiated the Manufacturing Technology program. This program is directed at strengthening our industrial base by focusing on manufacturing productivity. The program's objective is to develop and improve manufacturing processes, techniques, materials, and equipment to provide timely, reliable and economical production for defense equipment. The program is designed to "bridge the gap" between research and development innovations and industrial production. In February 1968, under DoD direction, a Manufacturing Technology Advisory Group (MTAG) was established by a triservice agreement. Triservice participation and coordination was designed to reduce the possibility of duplicating efforts. In February 1975, the Secretary of Defense directed the services to increase their emphasis and support of this program. This in turn resulted in DoD Directive 490.34, Defense Production Management, establishing a new policy for production management during the acquisition cycle. Within Air Force Systems Command the Director of Manufacturing under the DCS for Contracting/Manufacturing

published an excellent executive report which highlighted the need for increasing our use of the Manufacturing Technology program. Since that executive report, "PAYOFF 80", was published in October 1980, the Manufacturing Technology program has seen increased use by both Air Force Systems Command and Air Force Logistics Command. Now let's look at each of those acronyms we started off with.

MANTECH (Manufacturing Technology)

As noted above, MANTECH is a program to establish, validate and implement advanced manufacturing capabilities in an effort to improve:

- (1) Producibility
- (2) Productivity
- (3) Cost/Price Reduction
- (4) Quality Assurance

Each MANTECH program is jointly managed by the Materials Laboratory at Wright Patterson AFB and the sponsoring Product Division (this is for Air Force Programs). There are projects which support manufacturing requirements for aircraft, missile, space, and ground support production. These projects can be system-specific or generic in nature involving such areas as machining, composites, production integration, powder metallurgy, quality assurance technology, electronics packaging, digital and microwave electronic devices, flexible automated batch manufacturing, and conservation of critical/strategic materials. You should note that MANTECH project funds can't be used for capital facilities, new R & D efforts, or to further proprietary developments of a contractor. Next we can turn to TECH MOD.

TECH MOD (Technology Modernization)

This is a formal agreement (contractual) between a contractor and the Air Force (Product Division) to bring new and existing technologies and capital investment necessary to implement them onto the production floor at a contractor's facility. The TECH MOD approach was first used by the F-16 SPO at Wright-Patterson AFB.

The TECH MOD concept is to be looked at as a "win-win" relationship. A participating contractor benefits through financial incentives which promote a return of investment which was negotiated upfront. The Air Force benefits via reduced weapon system cost, improved quality and producibility, and through an improved industrial base.

Each TECH MOD has three distinct phases to its' life cycle.

Phase 1. Is a top down study of the factory with an objective to:

- (1) Identify problems and opportunities
- (2) Select candidate Phase II projects
- (3) Prepare preliminary estimates for capital requirements, production savings, and return on investment.
- (4) Negotiate a business arrangement, which is considered the heart of the TECH MOD and key to total program success.

Phase II. Will start after the business arrangement is established. During this phase:

- (1) The contractor updates individual project estimates
- (2) The Government funds acceptable projects
- (3) The Contractor finalizes individual project detail design, develops an implementation plan, and prepares a Phase II final report/Phase III proposal.

Phase III. Here Government approves the Phase III proposal and the Contractor does the following:

- (1) Makes necessary capital investment
- (2) Individual projects are implemented
- (3) Implementation and improvement costs are tracked
- (4) Savings are reported and shared with the Government
- (5) An open industry briefing and review is held at the contractor's facility to disseminate the TECH MOD results. Now let's turn our attention to IMIP.

IMIP (Industrial Modernization Incentives Program).

The IMIP program was initiated in November 1982 and has the same basic objectives as the TECH MOD program. In addition, IMIP's objective is to develop and refine contract incentives which encourage defense industries to use their own funds for productivity enhancing capital investments. The guidance for this program is in AFSC Regulation 800-17 and notes such incentives as contractor investment protection and shared savings both which are aimed at overcoming the primary problems of:

- (1) Program uncertainty.
- (2) Profit Policy which is based on cost.

As a SPO's Manufacturing Officer you are the focal point for each of these programs. Hopefully the above information will give you the basics, now it's up to you to get the regulations out. Also, you should meet the OPR at your Product Division who works MANTECH/TECH MOD/IMIP for this will be your starting point in getting projects into the Program Objective Memorandum (POM) cycle.

ENGINEERING CHANGE PROPOSAL (ECP)

An ECP is used to make an engineering change to a contract which in some way will affect one of the following areas: design, drawings, or specifications. Within the SPO an OPR is assigned to process each ECP that a contractor submits. The OPR must present the ECP to the Configuration Control Board (CCB) for approval prior to contract change.

Your objective is to look at each ECP to ensure producibility design characteristics have been considered. You should look at such manufacturing considerations as tooling, test equipment, performance characteristics, materials, processes, inspectibility, work force skill level, etc. Your evaluation of an ECP should be done in light of these changes relative to improving the producibility characteristics of the system. Insure any comment/concern you have is coordinated with the ECP OPR prior to the CCB.

As a reference look at MII -STD 480 and MII -STD 481 which cover configuration control and requirements for submittal of ECP's.

VALUE ENGINEERING (VE)

No VE is not a disease! Value engineering is a management tool which is designed to help analyze and evaluate system changes in developing the maximum benefit from available resources. The AF VE Program is covered in AFR 320-1. Within AFSC and product divisions, the supplement to this regulation provides unique reporting and local requirements for a successful VE program.

You should review your contract to determine if VE was a contractual requirement. Basic contract guidance can be found in Federal Acquisition Regulation (FAR) Part 48 and for those contracts written under the Defense Acquisition Regulation (DAR) you can look under Section 1 Part 17.

VE attempts to identify areas of excessive or unnecessary costs and through a team evaluation process looks to improve the value of an end item. Recommendations, to be acceptable, must provide the same or better performance at a lower cost while maintaining necessary quality, reliability, and maintainability. As noted in AFR 320-1, VE is most effective when applied during the development phase, but also can produce effective results when used in the production, deployment and operational phases of a program.

To further your understanding of VE, I suggest you take the Defense Management Joint Course offered by US Army Management Engineering Training Activity at Rock Island, Illinois, entitled "Principles and Application of Value Engineering". Also you should check with your contractor point of contact in Manufacturing to ensure they have AF Pamphlet 320-2 which is the VE Guide for Contractors. Any further questions you or the contractor might have should be directed to the Staff VE Monitor at your product division.

The following application checklist is taken from DARCOM Handbook 706-1.1-80 and is provided as a guide to help you generate some ideas when considering VE.

General

- a. Can the design be changed to eliminate parts?
- b. Can the present design be purchased at lower cost?
- c. Can a standard part be used?
- d. Would an altered standard part be more economical?
- e. If the part is to improve appearance, is its presence justified?
- f. Is there a less costly part that will perform the same function?
- g. Can the design be changed to simplify the part?
- h. Will the design permit standard inspection equipment to be used?
- i. Can a part designed for other equipment be used?
- j. Can the number of different materials be reduced?
- k. Can a less expensive material be used?
- l. Are there newly developed materials that can be used?
- m. Can the design be modified to permit manufacture on automatic machinery?

Machinery

- a. Are all machinery surfaces and finishes necessary?
- b. Will a coarser finish be adequate?
- c. Does design permit the use of standard cutting tools?
- d. Are tolerances closer than they need be?

- e. Can another material be used that would be easier to machine?
- f. Can a fastener be used to eliminate tapping?
- g. Can weld-nuts be used instead of a tapped hole?

Assembly

- a. Can two or more parts be combined?
- b. Can parts be made symmetrical?
- c. Is there a newly developed fastener to speed assembly?
- d. Are a minimum number of hardware sizes used?
- e. Are stock components called for if feasible?
- f. Can roll pins be used to eliminate reaming?

Specifications and Standards

- a. Is there a standard part that can replace a manufactured item?
- b. Can an altered standard part be used instead of a specific part?
- c. Can any specification be changed to effect a cost reduction?
- d. Is standard hardware used?
- e. Are all threads standard?
- f. Can standard cutting tools be used?
- g. Can standard gauges be used?
- h. Is there available material with tolerances and finishes that will eliminate machinery?

Quality Assurance

- a. Are inspection standards realistic?
- b. Is the present level of testing necessary?
- c. Can redundant inspection or tests be eliminated?
- d. Would redesign eliminate a quality problem?
- e. Can the design be modified to simplify inspection?

Packaging

- a. Is the present level of packaging needed?
- b. Can the packaging be simplified?
- c. Could different packing materials be used?
- d. Is bulk packing possible? Palletising?
- e. Can packaging be redesigned for automatic machinery?
- f. Is packaging arranged for lowest cost material handling?

Also, consider any unique requirements that your program might have. Work with your Staff VE Monitor and contractor to refine this list as necessary. It is an excellent idea to keep your CAS counterparts involved when making a VE evaluation.

Turning our attention to Chapter 5 you won't become a contracts expert, but you will learn about some of the manufacturing considerations that need attention prior to contract award. Don't forget you are part of the winning team!

Chapter Five

RFP/CONTRACT REQUIREMENTS

Here we'll cover some Request for Proposal (RFP) and contractual requirements that a Manufacturing Officer will be directly involved with. Each area discussed will provide you with enough information to get headed in the right direction. The amount of time needed to plan these activities will depend on the complexity of your contract. If accurate timely inputs are provided you need to work closely with your contracting officer. First we'll look at what a Manufacturing Management/Production Capability Review involves.

MANUFACTURING MANAGEMENT/PRODUCTION CAPABILITY REVIEW (MM/PCR)

The MM/PCR is an integral part of the source selection process. See AFR 70-15 Source Selection Policy and Procedures. To accomplish this review a team is formed with the Team Chief coming from the manufacturing division. The objective of this team is to evaluate the contractor's manufacturing operations, subcontract management system, manufacturing engineering and manufacturing planning system. Through their review, the team will determine if the contractor has, or can obtain in a timely fashion, required management systems and production capabilities to perform all existing and projected manufacturing activities. A MM/PCR will normally cover the following areas:

- . Manufacturing Organization
- . Product Design
- . Program Planning
- . Purchasing & Subcontracting
- . Make or Buy Plan
- . Manpower and Labor Relations
- . Industrial Engineering
- . Plant Layout
- . Manufacturing Engineering
- . Special Tooling & Test Equipment
- . Production Control
- . Facilities
- . Quality Assurance

Requirements to perform a MM/PCR should be included in the Program Management Directive (PMD) and Air Force Systems Command (AFSC) will flow down these requirements on the AFSC Form-56 (AFSC Program Direction). As part of your PMD review you can determine if an MM/PCR will be required. If one is, an excellent source for planning guidance is AFSC Pamphlet 84-4 Guide for Manufacturing Reviews and specifically Chapter 3.

Results of the MM/PCR form part of the proposal evaluation for the Source Selection process. As such, results are briefed to the Source Selection Evaluation Board (SSEB) Chairman to aid the selection process.

PRE AWARD SURVEY (PAS)

The objective of a PAS is to provide an affirmative or negative recommendation during source selection on a proposed contractor's capability to produce a particular end item. A PAS precedes contract award and provides an analysis of various data points relative to a contractor's capabilities. The PAS is normally performed by the Government Contract Administration Office (CAO) which can be supported by the buying activity.

During evaluation of a proposed contractor the PAS team will be looking for his ability to comply with the terms of the proposed contract. Therefore, team members must be familiar with the Request for Proposal (RFP) under consideration. In requesting a PAS, the buying activity contracting officer should specify the scope of the review and which of the following factors should be evaluated:

- . Technical Capability
- . Production Capability
- . Plant Facility and Equipment
- . Financial Capability
- . Purchasing and Subcontracting
- . Accounting System
- . Quality Assurance Capability
- . Transportation
- . Plant Safety
- . Security Clearance
- . Labor Resource
- . Performance Record
- . Ability to meet required schedule

As a manufacturing officer you would be most interested in the following attributes which are sub-sets of the areas noted above:

- . Manufacturing Personnel/Plant/Facilities
- . Production Equipment
- . Materials & Purchased Parts
- . Subcontracting relationships
- . Production Control
- . Status of Other Production Programs

In any case the CAO will be of great help in accomplishing a PAS. Additional information can be found in the Federal Acquisition Regulation section 9.106.

SOURCE SELECTION EVALUATION BOARD (SSEB) CRITERIA & EVALUATION

Policy and procedures for the Source Selection process can be found in AFR 70-15. The principal objective is to select a contractor who's proposal demonstrated the best ability to meet the Request for Proposal (RFP) requirements at an affordable

and:

The System Program Office (SPO) will identify the major areas to be evaluated during source selection. Normally these will include Technical, Management, Support, and Cost as the primary evaluation areas for most programs. Then under each of these major areas, you will find various disciplines such as testing, manufacturing, and design identified as areas to be evaluated. These areas are further broken down into factors which form the basis of a bottom-up proposal evaluation process.

As an example, the manufacturing portion of a program is under the Technical Area as shown in Figure 1.

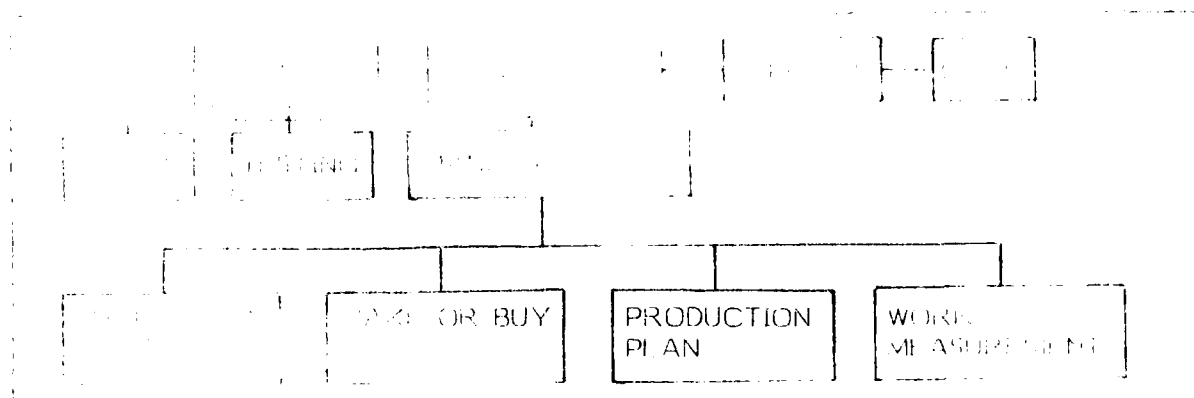


Figure 1. Example of the structure of source selection.

Each of these major evaluation areas has factors which could be considered under major areas of evaluation. For example, under the manufacturing factors, you will need to develop criteria that will be used to evaluate the various manufacturing factors. As an aid in developing the manufacturing evaluation criteria you should look at the Production Management/Production Planning and Control and Manufacturing Management/Production Management/Production Planning and Control sections of your evaluation criteria and your evaluation criteria should be related to the unique requirements of your program.

In the SPO proposal preparation instruction (PPI) the Contracting Officer has identified key areas the contractor must address in his proposal. These areas must correspond to the items and factors for which you and other SPO personnel have developed evaluation criteria.

During source selection, evaluation criteria will serve as an evaluation guide when looking at each one of these items/factors which the contractor addressed in his proposal. You will be looking for soundness of approach and any risk which might be evident in how the contractor will meet proposed requirements.

Evaluation of each major area is integrated into an overall assessment of the contractor. Based upon their assessment of each contractor's proposal the SSFB makes their recommendation to the Source Selection Authority (SSA). The SSA in turn selects a contractor who best meets the requirements at an affordable cost.

POST-AWARD REVIEW

After announcement of the winning contractor a Systems Program Office (SPO) will normally hold a post-award review. Representatives from various SPO functional areas will meet with the contractor to review contractual documents in order to clarify any misunderstanding on either side. Also, the Statement of Work (SOW), MIL-Standards, and program requirements documents should be discussed.

This review would be a good time to identify contractor points of contact in such manufacturing areas as planning, estimating, engineering, and shop control. You will need to review the contractor's procedures for identifying requirements for special tooling/test equipment and Government Furnished Property/Equipment items.

The bottom line is; this will be your opportunity to establish a structure for communications to interface with the contractor. If you enter an established SPO most of these points of contact are well defined. However, you still need to get out and meet these people in order to keep the lines of communication open and working.

SHOULD COST

Prior to negotiating a contract the Program Manager can request that a Should Cost analysis be performed. Effectiveness of a Should Cost analysis will depend on the coordinated efforts of a Government team with specialists from acquisition, contract administration, audit, management, pricing, and engineering to do an in-depth cost analysis at a contractor's facility. The team will use a contractor's historical data in evaluating the current proposal in order to arrive at a Government negotiation position. During a Should Cost, you will be looking for inefficient practices in the contractor's management and operations that when corrected will reduce the cost of the program about to enter negotiations.

You will be responsible for evaluation of the manufacturing activities under consideration. AF Pamphlet 70-5 provides very detailed procedures that can prove very helpful in getting organized. Focus on Chapter 5 and Attachment 4 of that Pamphlet. Also, check around your own manufacturing division for someone who has done this before.

MAKE OR BUY ANALYSIS

The contractor develops a Make or Buy Plan which identifies major assemblies/components which are to be manufactured, developed, or assembled in his facilities and those which will be obtained from a subcontractor. The Systems Program Office (SPO) must analyze these proposed make or buy policies and intentions to ascertain if the plan is in the best interest of the government. Decisions regarding Make or Buy objectives are normally made in the early product development phase of program.

Make or Buy Analysis provides a technical review of a contractor's internal manufacturing capabilities and evaluates the subcontractor/vendor capabilities to provide certain products. Figure-4 identifies the Government/Contractor Make or Buy factors which need to be considered. This list of factors was taken from the Defense Systems Management College Manufacturing Management Handbook.

FACTORY	CONTRACTOR
GOVERNMENT	
<ul style="list-style-type: none"> Contractor's consideration of other firms, especially small business and labor surplus area concerns (especially if the contractor proposes to request additional government facilities) Contractor make-or-buy history Small business and labor surplus area concerns subcontracting Elements such as the nature of the items, experience with similar items, future requirements, engineering, tooling, starting load costs, market conditions, and the availability of personnel and materials Proposed type and level of technical effort intended for inclusion in subcontracts "Make" item review if the items or service: <ul style="list-style-type: none"> A) Are not regularly manufactured or provided by the contractor, and are available from any other firm at prices no higher than if the contractor should make or provide the products or services, or B) Are regularly manufactured or provided by the contractor, but are available from any other firm at lower prices. 	<ul style="list-style-type: none"> Is the work something that is normally performed in-house? Does the work utilize in-house technology? Is the work compatible with other in-house operations? Will in-house effort develop capabilities for future business? What resources are needed to perform the work? Is there adequate capacity? Is it more efficient to perform the work in-house or subcontract it considering the impact on costs, quality, and schedules? Is there a qualified source that can do the work? Can the work be performed by small or minority business? Is the need for control related to system integration?

Figure 4. Government-Contractor Make or Buy Considerations

You can see that the contractor looks at it from a standpoint of does he have the capability within house to do the task. The government, i.e. SPO, wants to ensure their best interests are protected. Sometimes the two viewpoints aren't compatible in which case the SPO must make a decision after considering cost, schedule, and performance requirements on where an item will be made. For contractual guidance refer to FAR Subpart 15.7.

COMPONENT BREAKOUT

The objective of component breakout is to determine whether or not assemblies and other major elements of a system should be purchased by the government directly. These items would then be furnished to the end item contractor as government furnished material. A SPO is responsible for making this determination for which consideration must be given to the possible affect on cost, schedule, and performance.

The following guidelines, noted in the Defense Systems Management College Manufacturing Management Handbook, should be of some help when you are called upon to participate in a component breakout evaluation.

- 1) Is the design of the component and the design of the end item, insofar as it will affect the component, sufficiently stable that further design or engineering effort by the end item contractor in respect to the component is unlikely to be required?
- 2) Is a suitable data package available with patent rights to use it for government procurement?
- 3) Can any problems of quality control and reliability of the component be resolved without requiring effort by the end item contractor?
- 4) Is it anticipated that requirements for technical support (i.e., functions such as development of proposed detailed specifications; development test requirements to prove design adequacy or compliance with design; monitoring tests to assure compliance with established requirements; definition of product assurance requirements associated with the manufacture of articles; and analysis and correction of service-revealed deficiencies) performed by the end item contractor will be negligible? If not, are resources (personnel, technical competence, facilities, etc.) available to provide such support, or can such support be obtained from the end item contractor (even though the component is broken out) or other source?
- 5) Can breakout be accomplished without causing unacceptable difficulties in logistics support (standardization of components)?
- 6) Can breakout be accomplished without causing fragmentation of the end item that might materially impede administration, management, and performance of the end item contract (unduly complicating manufacturing scheduling or identifying end item failure that may be caused by a defective component)?
- 7) Can breakout be accomplished without jeopardizing delivery requirements of the end item?

8) If a decision is made to breakout a component and to acquire it from a new source, can advance procurement funds be made available to provide that source any necessary additional lead time?

9) Is there a source other than the present manufacturer capable of supplying the component?

10) Has the component been purchased directly by the government as a support item in the supply system or as GFE in other end items?

11) Would the financial risks and other responsibilities being assumed by the prime contractor that will have to be assumed by the government if the item was broken out be acceptable?

12) Will breakout result in substantial net cost savings? Estimates of potential savings in cost should be developed for each case on its own facts, with consideration given to any estimated offsetting costs such as increases in the cost of requirements determination and control, contracting, contract administration, data package purchase, material inspection, qualification or preproduction testing, ground support and test equipment, transportation, security, storage, distribution, and technical support.

GOVERNMENT FURNISHED PROPERTY/EQUIPMENT (GFP/E) ANALYSIS

Management of GFP/E will vary between SPO's with responsibility being either with manufacturing or logistics personnel. Whichever the case may be, the Program Manager must identify a GFP/E Manager to ensure proper attention is directed to this area. A GFP/E Manager is responsible for the following:

- 1. Review the contractor's proposal and ECP's for any initial/additional GFP/E requirements.

- 2. Prior to approval of any contractual action ensure that contractor need dates are met and GFP/E is available for his use.

- 3. When GFP/E is accountable to another (U.S.) government contract the contracting officer must give approval prior to use of this GFP/E on another contract. The GFP/E Manager is responsible for getting this approval in writing.

- 4. Work with the contractor to maintain an up to date schedule reflecting all GFP/E need dates and quantities. This should be a contractual requirement.

- 5. Develop a GFP/E Management Plan so all SPO and related support organization personnel know how GFP/E requests must be processed.

- 6. Establish points of contact within the Contract Administration Office and contractor to work the day-to-day problems.

If management of the GFP/E area is neglected the SPO could be impacted when contractor need dates aren't met resulting in schedule slips and costly work arounds. Stay on top of this area by working with the contractor to resolve problems prior to schedule impact.

MANUFACTURING FACT FINDING

This function is to perform a technical review and evaluation of a contractor's proposal in the area of manufacturing. Fact Finding is a way of establishing the government negotiation position for a proposal. This fact finding can be either formal (where you go and talk with the contractor) or informal (the review and evaluation is done within the SPO). Each functional area does a similar review of their portion of the proposal.

From a manufacturing standpoint you would want to look at the following areas which is by no means all inclusive:

- . Fabrication and Assembly Labor
- . Material Usage Rates
- . Scrap and Rework Factors
- . Labor Standards
- . Realization Factors
- . Manufacturing Engineering
- . Tooling Requirements/Changes
- . Special Tooling Needs
- . Special Test Equipment Requirements
- . Etc.

Prior to performing your fact find responsibilities I suggest that you get a copy of AFCDMDR 70-8 and review Chapter 7 on Technical Evaluations. You will find some helpful guidance in getting started. Another suggestion would be to have an agreed upon fact finding evaluation sheet which will be used by all SPO functional areas. This will simplify the process of pulling all of the fact finding information together in a single format. Figure-5 is an example which was used on the Inertial Upper Stage Program.

As we move into Chapter 6 we'll cover sustaining activities that will bite you around the ankles if ignored. So keep the insecticide spray handy as you move on!!

APPENDICES

CONTINUED

SDDM - Secretary of Defense Decision Memorandum

SDR - Space Division Regulation

SDR - System Design Review

SECDEF - Secretary of Defense

SON - Statement of Need

SOW - Statement of Work

SPO - Systems Program Office

SRR - System Requirements Review

SSA - Source Selection Authority

SSFB - Source Selection Evaluation Board

SI - Signal Intelligence

STE - Special Test Equipment

TECH MOD - Technology Modernization

VE - Value Engineering

WM - Work Measurement

CONTINUED

SLS - Integration & Logistics Support
MIP - Industrial Modernization Incentives Program
PS - Integrated Programs Summary
US - Inertial Upper Stage

LC - Life-Cycle Cost
LI - Letter of Instruction

MANTECH - Manufacturing Technology
MENS - Mission Element Need Statement
MIL-STD - Military Standard
M/PCR - Manufacturing Management/Production Capability Review
MO - Manufacturing Officer
MOA - Memorandum of Agreement
MOU - Memorandum of Understanding
MPR - Monthly Program Review
MTAG - Manufacturing Technology Advisory Group
MUL - Master Urgency List

NASA - National Aeronautics and Space Administration
NAVPRO - Navy Plant Representative Office

OI - Operating Instruction
OPR - Office of Primary Responsibility
OT&E - Operations Testing & Evaluation

PAS - Pre Award Survey
PCA - Physical Configuration Audit
PD - Productive Directorate
PDR - Preliminary Design Review
PEO - Product Engineering Service Organization
PM - Program Manager
PMO - Program Management Directive
PMP - Plant, Materials, & Process
PMP - Program Management Plan
POM - Program Objective Memorandum
PP - Program Preparation Instructions
PRO - Plant Representative Office
RR - Readiness Review

RP - Request for Proposal

GLOSSARY

AB - Air Base
ACO - Administrative Contracting Officer
ACSC - Air Command and Staff College
AD - Armament Division
AFB - Air Force Base
AFCMD - Air Force Contract Management Division
AFPRO - Air Force Plant Representative Office
AFSC - Air Force Systems Command
AFSCR - Air Force Systems Command Regulation
AFR - Air Force Regulation
ASD - Aeronautical Systems Division

BMO - Ballistic Missile Office

CAD - Computer Aided Design
CAM - Computer Aided Manufacturing
CAO - Contract Administration Office
CAS - Contract Administration Service
CCB - Configuration Control Board
CDR - Critical Design Review
CDRL - Contract Data Requirements List
CI - Configuration Item
CM - Configuration Management
CODSIA - Council of Defense and Space Industry Association
C/SCSC - Cost/Schedule Control System Criteria

DAR - Defense Acquisition Regulation
DCAS - Defense Contract Administration Service
DMS - Defense Materials System
DOD - Department of Defense
DPS - Defense Priorities System
DTC - Design To Cost

ECP - Engineering Change Proposal
ESD - Electronic Systems Division

FAR - Federal Acquisition Regulation
FCA - Functional Configuration Audit

GEF - Government Furnished Equipment
GFP - Government Furnished Property

CONTINUED

MB -SD-1567A. Work Measurement. 11 March 1983.

CONTINUED

- U.S. Department of the Air Force. Program Control - Financial. AF Regulation 800-6. Washington, DC: Government Printing Office, 7 September 1976.
- U.S. Department of the Air Force. Source Selection Policy and Procedures. AF Regulation 70-15. Washington, DC: Government Printing Office, 22 February 1984.
- U.S. Department of the Air Force. Value Engineering Guide For Contractors. AF Pamphlet 320-2. Washington, DC: Government Printing Office, 19 September 1983.
- U.S. Air Force Systems Command. A Guide for Program Management. AFSC Pamphlet 800-3. Andrews AFB, MD, 9 April 1976.
- U.S. Air Force Systems Command. AFSC Business Strategy Panel. AFSC Regulation 70-2. Andrews AFB, MD, 2 May 1980.
- U.S. Air Force Systems Command. AFSC Solicitation Review Panel. AFSC Regulation 70-7. Andrews AFB, MD, 2 May 1980.
- U.S. Air Force Systems Command. Configuration Management. AFSC Pamphlet 800-7. Andrews AFB, MD, 1 December 1977.
- U.S. Air Force Systems Command. Government-Furnished Equipment/Contractor-Furnished Equipment (GFE/CFE) Selection Process, GFE Acquisition and GFE Management. AFSC/AFLC Regulation 800-31. Andrews AFB, MD, 13 July 1979.
- U.S. Air Force Space Division. "Tips For More Productive Design Reviews." Space Division, Los Angeles AFS, CA, June 1981.
- DOD-STD-489A. Configuration Control, Engineering Changes, Deviations and Waivers. 12 April 1978.
- MIL-STD-481A. Configuration Control, Engineering Changes, Deviations and Waivers. 18 October 1972.
- MIL-STD-499A (USAF). Engineering Management. 1 May 1974.
- MIL-STD-965. Part Control Program. 15 April 1977.
- AFR-STD-1521A (USAF). Technical Reviews and Audits For Systems, Equipment, and Computer Programs. 1 June 1976.
- MIL-STD-1528 (USAF). Production Management. 1 August 1972.

CONTINUED

12. U.S. Air Force Systems Command. Production Readiness Review. AFSC Regulation 84-2. Andrews AFB, MD, 7 January 1981.
13. U.S. Air Force Systems Command. Technology Modernization (TECH MOD). AFSC Regulation 800-17. Andrews AFB, MD, 1 November 1983.

Unpublished Materials

14. U.S. Air Force Systems Command. "Payoff 80 Executive Report." DCS/ Contracting and Manufacturing. Andrews AFB, MD, 1 October 1980.
15. Huffman, James W., Maj, USAF. "Guide For Weapon Systems Acquisition." Unpublished Staff Problem Solving Report C-234, Air Command and Staff College, Air University (ATC), Maxwell AFB, Alabama, 1981.
16. Nicastri, Edward D., Maj, USAF. "The SPO Engineer's Handbook." Unpublished Staff Problem Solving Report C-190, Air Command and Staff College, Air University (ATC), Maxwell AFB, Alabama, 1981.

B. RELATED SOURCES

Official Documents

- U.S. Department of the Air Force. CFE vs GFE Selection Process. AF Regulation 800-22. Washington, DC: Government Printing Office, 30 August 1976.
- U.S. Department of the Air Force. Industrial Base Program Planning. AF Regulation 78-10. Washington, DC: Government Printing Office, 20 April 1984.
- U.S. Department of the Air Force. Industrial Labor Relations Activities. AF Regulation 78-1. Washington, DC: Government Printing Office, 12 February 1979.
- U.S. Department of the Air Force. Life Cycle Cost Management Program. AF Regulation 800-11. Washington, DC: Government Printing Office, 27 January 1984.
- U.S. Department of the Air Force. Management of Industrial Facilities. AF Regulation 78-22. Washington, DC: Government Printing Office, 26 July 1976.
- U.S. Department of the Air Force. Parts Control Program (PCP). AF Regulation 800-24. Washington, DC: Government Printing Office, 2 December 1977.

BIBLIOGRAPHY

A. REFERENCES CITED

Official Documents

1. Defense Systems Management College. Manufacturing Management Handbook For Program Managers. Fort Belvoir Virginia, January 1982.
2. Headquarters US Army Material Development and Readiness Command. Manufacturing Technology Handbook. DARCOM Handbook 706-1.1-80. US Army Management Engineering Training Activity, Alexandria, VA, March 1980.
3. Report To The Congress. Manufacturing Technology--A Cost Reduction Tool At The Department of Defense That Needs Sharpening. Report Number PSAD-79-99, 11 September 1979.
4. U.S. Department of the Air Force. Acquisition Program Management. AF Regulation 800-2. Washington, DC: Government Printing Office, 13 August 1952.
5. U.S. Department of the Air Force. Air Force Value Engineering Program. AF Regulation 320-1. Washington, DC: Government Printing Office, 15 November 1976.
6. U.S. Department of the Air Force. Manufacturing Management Policy For Air Force Contracts. AF Regulation 800-9. Washington, DC: Government Printing Office, 8 November 1983.
7. U.S. Department of the Air Force. Manufacturing Technology Program. AF Regulation 800-33. Washington, DC: Government Printing Office, 25 April 1952.
8. U.S. Department of the Air Force. Should Cost. AF Pamphlet 70-5. Washington, DC: Government Printing Office, 19 September 1979.
9. U.S. Air Force Systems Command. AFSC Guide for Manufacturing Reviews. AFSC Pamphlet 84-4. Andrews AFB, MD, 28 January 1978.
10. U.S. Air Force Systems Command. Defense Material and Priorities Systems. AFSC Regulation 78-2. Andrews AFB, MD, 21 July 1977.
11. U.S. Air Force Systems Command. Manufacturing Management. AFSC Regulation 800-9. Andrews AFB, MD, 21 September 1984.

at the prime contractor. He will be your direct interface in getting acceptable hardware delivered to the government.

If possible when you visit the contractor attend the manufacturing meetings your counterpart holds. Always ask to see the manufacturing facility to enhance your understanding of the hardware and ability to deal with problems when they arise.

As a minimum, you should talk with the Manufacturing Manager once a week concerning program status. This will help you keep the Program Manager knowledgeable of any problems and what corrective actions are being taken. By working with and not against each other hopefully any hiccups in manufacturing will be minimal.

Best of luck and success to each of you that read this handbook. The job you have undertaken can be a rewarding experience, but it requires effort on your part. Use this handbook to stay on the road to success.

EARLY INVOLVEMENT IS THE KEY

Today's modern weapon systems require that you as a Manufacturing Officer have an input in determining system requirements and the design approaches which will be used. The technology advances in manufacturing methods and procedures will help determine design characteristics of the system. An example of this is the interface between Computer Aided Design and Computer Aided Manufacturing (CAD/CAM). You are responsible for making the SPO knowledgeable of these new capabilities.

Your early involvement will help ensure that necessary producibility considerations are addressed by the designer. These considerations will be covered in the Preliminary Design Review (PDR) for which you should be a key member.

Early program involvement will allow you to incorporate all necessary contractual manufacturing requirements noted in MIL-STD's 1521A, 1528, 1567A; DI-P-3460; and applicable regulations. Also, keep up to date on Federal Acquisition Regulation's (FAR) and regulation changes so follow-on contracts will reflect most current guidance. Don't sit back and wait for something to happen - You make it happen!

WORK WITH AFPRO/DCAS COUNTERPARTS

The personnel in the plant representative office and Defense Contract Administration Service can be of great help to you. They are your eyes and ears at the contractor's facility on a daily basis. Through them you will be able to get the government point of view on how a program is going. When you need help with proposal evaluations or fact-finding don't forget to keep them in the loop.

Prior to a visit at a contractor's facility let your AFPRO/DCAS counterpart know you are coming and always make time to see them. A face-to-face meeting can do wonders for your working relationship. Show an interest in what they are doing and let them know you appreciate their help.

Remember the AFPRO/DCAS personnel can be of great assistance, but you need to let them know what you need. Always keep your counterparts up to speed on what the SPO and you in particular are doing. Good two-way communications help to strengthen your working relationships.

ESTABLISH POINTS OF CONTACT WITH OTHER SUPPORTING AGENCIES

Don't overlook supporting agencies that could be of help to you in getting the job done. Find out who the manufacturing point of contact is and get to know them.

Other agencies such as NASA, Materials Laboratory at Wright Patterson AFB; other Product Divisions (ESD, ASD, AD, BMO); etc. also have experts in the field of manufacturing. This wealth of information is just a phone call away so don't let it go untapped.

KNOW YOUR CONTRACTOR COUNTERPART

You must establish a good working relationship with the Manufacturing manager

Chapter Seven

FINAL THOUGHTS

Hopefully, as a new guy or gal assigned to the Manufacturing career field you have found this handbook to be a useful foundation upon which to build your knowledge base. Likewise the more experienced Manufacturing Officer should keep this reference document close by as a guide to find more detailed information when required.

On a personnel basis you can expand this handbook to include new topics or initiatives that are pertinent to manufacturing. Also, as you attend various training courses, the handy guides or notes you come away with can serve as supplemental material to the information provided in this handbook.

This author found the major subareas of this chapter, though common sense in nature, were oftentimes overlooked. As you read them, see how you measure up. It would be a good idea to review these on a periodic basis so as not to lose sight of what you are doing and the important interfaces you must maintain.

Likewise study Appendix B which was developed as a self inspection checklist by the Productivity Directorate (SD/PD) at Space Division. This should serve as a good review and as an evaluation of your understanding concerning various manufacturing requirements.

BE PART OF THE SPO TEAM

As the Manufacturing Officer it is important that you integrate your activities within the SPO. By starting with the Program Manager and his staff let them know what you can/will do for them. Don't sit back waiting for them to come to you.

To step out on the right foot you need to know what the regulations (AF, AFSC, and Product Division) say are the important manufacturing responsibilities. Based on your program, develop a plan to address pertinent manufacturing responsibilities noted in the contract or covered by regulation (i.e. Production Readiness Review). Then communicate to the SPO personnel what you are working on and where you need their help. Also, you need to get out from behind the desk to see what the folks in engineering, logistics, contracts, quality assurance, etc. are having problems with.

By showing an interest and a willingness to help, you become a team member. Now the ball is in your court to do the best job you can.

Any contract abnormalities you note should be brought to the attention of the SPO's contracting officer for resolution.

LABOR RELATIONS/STRIKE IMPACT REPORTING

Normally the Manufacturing Officer will be the SPO focal point providing an assessment status on any labor relations or strike impact activities. Working through the Contract Administration Service (CAS) and Defense Contract Administration Service (DCAS) you will receive a written impact evaluation. These evaluations will look ahead 30, 60, and 90 days to determine how your program will be affected. In order to get timely information you can get a "heads up" over the phone from the CAS/DCAS on what will be in their written evaluation impact statements.

As the SPO focal point you must consolidate this information and brief the Program Manager. Additionally, you need to inform the product division labor relations monitor so proper reports can be sent to Higher Headquarters. For more information on this area consult AFR 78-1.

DEFENSE MATERIALS AND PRIORITIES SYSTEM

The Defense Materials System (DMS) and Defense Priorities System (DPS) both grew out of the Defense Production Act of 1950. The aim of these programs is to help insure that defense programs are maintained on schedule by providing a priority status system for the purchase of materials and products. By looking at the Master Urgency List you will be able to determine the priority rating assigned to your program. Either a DD-rating or DX-rating will be assigned to your program. You should get a copy of your program's contract to determine if the corrected rating is noted on the cover page. If it isn't get with the SPO Contracting Officer to have it corrected.

Normally the contractors are very familiar with DMS/DPS in ordering materials to support the program. However, when problems or questions arise you should try to work these first with the contractor and local Contract Administration Service office. Also, the Joint Aeronautical Materials Activity (JAMAC) located at Wright-Patterson AFB, Ohio should be contacted because of their expertise in DMS/DPS. If a problem can't be solved the contractor should submit a ITA Form 999 "Request for Special Priorities Assistance". The key is to know a system is available to resolve priority problems. For more detailed information you should refer to AFR 70-24, AFM 78-4, and AFSCR 78-2.

In Chapter 7 this author will give some sage advice that should help make your job easier. Your task is to build upon this information and pass it on to the new guy or gal that comes looking for help. Good luck.

remember to keep those lines of communication open and working as they can produce most of the help you need.

GOVERNMENT FURNISHED PROPERTY (GFP) MANAGEMENT

Management of GFP/E was pointed out in Chapter 5 as a very important pre-contract award analysis function. Likewise management responsibility continues after contract award in the following areas:

- . Establishing, Coordinating, and Approving of required GFP items.
- . Assuring necessary support is provided by other government agencies.
- . Assuring Contract Administration Service (CAS) GFP surveillance identifies potential problems to the SPO GFP manager.
- . Monitoring GFP contract changes to ensure need dates can be met.
- . Working with the contractor to prepare a monthly GFP status report to reflect shortages, deliveries, and next month's projected needs.

You can see there are many things which will require your attention. However, the amount of time devoted to these activities should be minimal based on good procedures/working relationship you have with the CAS and contractor. The GFP monthly status report will also serve as a key management tool to keep this area on track.

SUBCONTRACTOR MANAGEMENT

This objective is to ensure that subcontractors provide their contractual end items/services to the prime contractor according to schedule. Most SPOs rely on the prime contractor to effectively manage his subcontractors and only get involved when a problem affects total program cost/schedule/performance. As manufacturing officer you need to have a working knowledge of the prime's schedule and technical interface with their subcontractors. By working with the Contracting Administration Service office you should be able to identify problem areas to the SPO in a timely manner. Subcontractor delivery slippage on a due date is too late to protect the SPO's best interest.

Try to concentrate your attention on those subcontractors which provide a critical end item/service and/or have a high contract dollar amount associated with their work. The CAS will be of great help and also don't neglect the services of the Defense Contract Administration Service (DCAS) in monitoring subcontractor progress.

Normally the prime will hold program reviews with each major subcontractor and if possible it would be a good idea to attend these on a periodic basis. This will afford you the opportunity to keep contact with key players and assess the information you receive from the CAS/DCAS/Prime.

It is also important that you ensure all prime contractual flow down requirements in the area of manufacturing have been incorporated in the subcontractor's contract.

Chapter Six

SUSTAINING MANUFACTURING TASKS

Topics covered in this Chapter are of a sustaining nature and will tend not to attract your due diligence attention. Even though the contract is negotiated and the contractor is delivering hardware from a manufacturing standpoint, you can't step back and relax. The amount of time you spend on these following items will again depend on the size and maturity of your program. First up for discussion is the area of Production Surveillance.

PRODUCTION SURVEILLANCE

Production surveillance is a continuing review of the contractor's manufacturing planning, scheduling, and controlling systems to ensure that delivery of hardware, will meet the contract schedule. Knowledge of potential delivery slippage allows the contractor and SPO to develop work around plans in order to minimize impact on the program.

As noted in Chapter 3, production surveillance is performed by the Contract Administration Service (CAS) office. However, it is important that you as the manufacturing officer be actively involved.

In order to be an active participant in this function you need to establish good working communication with the production personnel at the CAS. As a minimum you should call once a week to get a "HOW-GOES-IT" on the program. Likewise it is important to talk with the contractor's manufacturing manager to get his perspective on the program's progress. By talking to the CAS and contractor you get a feel for the program's health, but this isn't enough.

You need to get back from your desk and make a trip to the contractor's facility at least once a month and what you are getting over the phone. Most programs conduct a monthly Management Review (MPR) at the contractor's facility and this would be an excellent opportunity to get out and check system and hardware status. Prior to the trip talk with the contractor's manufacturing manager and arrange for a tour of his facility. It would also be a good idea to invite CAS production personnel to accompany you on this tour. You want to ensure that any problem areas are identified and that both contractor and government positions are known. The SPO, CAS, and contractor need to work together as a team in order to meet all cost, schedule, and performance requirements of the contract. Another part of the production surveillance that you will monitor is the contractor's delivery progress.

When the government takes receipt of title for an end item normally a DD-250 is generated and sent to the contractor. You will be the SPO focal point to track all items received. Again the CAS and contractor will be of great help. Just

Appendix A

SAMPLE MANUFACTURING OPERATIONS MOA

1. The AFPRO will perform Manufacturing Operations contract administration functions in accordance with FAIR Subpart 42.3, and AFCDMDR 84-1, "Manufacturing Operations," as modified or supplemented below:

a. Evaluate the effectiveness of the contractor's Producibility Program; review/analyze contractor's producibility analyses and trade-off studies; review its participating participation in Design to Cost Program. Provide evaluation results to the SPO.

b. Provide evaluations, findings, and recommendations on the contractor's Production Plan. Monitor execution of plan and report noncompliance/significant deviations to the SPO.

c. Provide a monthly manufacturing status report, to include:

- (1) A list of major production schedule events due and those delayed.
- (2) A list of contractor furnished equipment due but not delivered.
- (3) A discussion of major items of interest

d. Provide scrap and rework analysis (quarterly) of manufacturing efforts.

e. Provide delinquency forecasting and/or reporting. Method of initial notification to reflect significance.

f. Identify manufacturing high risk areas; provide assessments of contractor risk and mitigation efforts.

g. Participate in formal reviews conducted by the SPO (program management reviews, design reviews, configuration audits, technical interchange meetings, etc.).

h. Review all manufacturing CDRL item submittals and provide comments to the SPO on deficiencies/inadequacies.

i. Provide support for prime contractor and subcontractor planning-for-rate reviews. Participate in management systems areas (scheduling, production planning, inventory management), and other areas mutually agreed to with the SPO.

j. Provide support for government furnished property management in the manufacturing area.

- (1) Scheduling/need date validation.
- (2) Deliveries/acceptance.
- (3) Proposal review for use, overhaul and/or modification, and repair.
- (4) Claim evaluation.

k. Review the contractor's requirements for special tooling/special test equipment (ST/STE), coordinate ST/STE requests with the Program Office prior to approval/disapproval and submit recommendations to the ACO.

l. Conduct special studies and surveys related to manufacturing operations as requested by the SPO.

m. Advise the SPO of any inadequacies in the production portions of contract specifications.

2. The SPO will:

a. Coordinate system, design, program, and manufacturing reviews with the AFPRO. Ensure that the AFPRO is on distribution for appropriate CDRL items, meeting minutes, and manufacturing reports initiated by the SPO.

b. Keep the AFPRO informed on decisions, problems, and changes pertaining to the manufacturing aspects of the program.

c. The SPO Manufacturing Officer will provide a copy of their monthly activity report directly to the AFPRO Manufacturing Operations Division.

3. Telephonic communications should be exercised to the maximum extent possible between the AFPRO and the SPO for the maintenance of the latest Program manufacturing status.

Appendix B

PRODUCTION/MANUFACTURING MANAGEMENT CHECKLIST

PART I Production Management

I. Production Planning

Are you familiar with key regulations, such as FAR 42.3 and AFSCR 84-1; MIL-STD-1528; MIL-STD 1567A; DI-P-3460; AFR 800-9; AFSCR 800-9; and MIL-STD-1521A.

- a. Do you generally rely on these regulations in doing your job? _____
- b. To what extent are these regulations applicable? _____
- c. What have you done to insure that the intent of the applied regulations are being followed? _____
- d. Who or what organizations within the SPO is responsible for manufacturing-related design activities? _____
- e. Who or what organization within the SPO is responsible for production planning functions? _____
- f. Do you provide direction/guidance to the organization(s) regarding manufacturing management? _____
- g. Do you reevaluate leadtimes? How often? _____
- h. Do you participate in the establishment of program requirements? If yes, in what way? _____
- i. In what way do you participate in the preparation of work statements? _____
- j. Does the SPO have MOAs or office instructions covering applicable portions of the Production/Manufacturing area? If not, why? _____

II. Production Surveillance/Reporting

- 1. What type of production surveillance technique are you utilizing? _____

2. Is the production surveillance technique prescribed under FAR 42.3 satisfactory? If not, why? _____

3. Is there an MOA (or LOI for DCAS) between the SPO and AFPRO covering production surveillance requirements? Is it adequate? Is it current? _____

4. Has SPO experienced any problems in making proper decisions for: _____

a. Committing to production? e.g., PRR data? _____

b. Anticipating program, schedule, or cost impacts? _____

c. Preparing for proper follow-on procurements? _____

5. Is the information acquired from CAO adequate for: _____

a. Verifying a, b, and c above? _____

b. Satisfying higher headquarters reporting requirements? _____

6. Have Criticality Designators been properly assigned to all contracts in accordance with FAR 42.1105? Are designators assigned to supporting and supported programs consistent? Are MOA's or LOI's consistent with the level of the assigned designators? _____

7. Is Production Progress information required on contract(s)? If not, why? _____

III. Government Furnished Property/Services

1. Are you familiar with regulations covering applicable areas of GFP? _____

2. Are there office instructions or MOAs that cover all aspects of the subject? _____

3. Is there an MOA or LOI with principal CAOs tying down each organization as to who does what to insure that all GFP/Services are furnished on a timely basis? _____

4. Is the system being utilized effectively to insure timely delivery of GFP/Services to contractors? What means does SPO management use to know the status in this area? _____

5. How are determinations made as to what will be Government furnished? Do production personnel participate in these decisions? _____

6. Are all proposals for Special Tooling and Special Test Equipment (ST/STE) reviewed.

IV. Make or Buy

1. Are you familiar with current policies and procedures (FAR 15.7)?

2. Is there an internal OI or MOA? If so, is it effective?

3. Do you participate in Make-or-Buy Reviews?

V. Component Breakout

1. Are you familiar with current policies and procedures (FAR DOD SUP 17.7202)?

2. Is there an internal OI or MOA? If so, is it effective?

3. Are there any current problems or are there any future problems anticipated in this area?

4. Do you make sure that adequate rationale is provided which substantiates component breakout decisions?

VI. Priorities and Allocations

1. Are you familiar with regulations (FAR 12.3, AFR 70-24; AFM 78-4)?

2. Is there an internal OI for use in revising and/or updating the Master Urgency List (MUL)?

3. Do production personnel participate in the decision as to what priority rating to use on contracts being awarded?

4. Should the need arise, are you familiar with contractor requests for priorities assistance (TFA Form 999) or requests for priority assignments on production equipment (DD Form 621)?

5. Is the SPD production office familiar with JAMAC (Joint Aeronautical Materials Activity) and how that activity fits into the priorities and allocations program?

6. Have there been any recent problems relative to use of the DX priority rating?

VII. Labor Relations/Strike Impacts

1. Are you familiar with (AFR 78-1)?

2. Do you maintain an OI for this area?

3. Is there a good working relationship between you and CAOs on strike impact reporting?

4. Are you experiencing any problems in the general Labor Relations/Strike Impact area?

5. Do you immediately report any knowledge of threatened or actual labor disputes to the staff labor relations monitor?

6. Do you have and use the Calendar of Defense Contractor Labor-Management Agreement Expirations Listing?

PART 2 Manufacturing Management

I. Capability Estimates

1. Was a System Requirements Review (SRR) accomplished (MIL-STD-1521A) or is on scheduled?

2. Was it in-house or held with contractor(s)?

3. If SRR was held in-house what was the SPO manufacturing activity input for the production capability estimate?

4. If SRR was held with contractor(s) was paragraph 5.1, Production Capability Estimates, of MIL-STD-152P placed on contract(s)?

5. If SRR was held with contractor(s) what was the SPO manufacturing activity input for the production capability estimate?

II. Feasibility Assessments

1. Was A System Design Review (SDR) accomplished (MIL-STD-1521A) or is one

scheduled?

2. Was it in-house or held with contractor(s)?

3. If SDR was held in-house what was the SPO manufacturing activity input for the production feasibility assessment?

4. If SDR was held with contractor(s) was paragraph 5.3, production feasibility, of, MIL-STD-1528 placed on contract(s)?

5. If SDR was held with contractor(s) what was the SPO manufacturing activity input for the production feasibility assessment?

III. Support to RFP

1. Did SPO manufacturing activity participate in the preparation of the RFP?

2. Was a Production Plan, DI-P-3460, requested?

3. If appendix A of MIL-STD-1521A (SRIR) was applied, was paragraph 5.2, production capability estimated, of MIL-STD-1528 applied?

4. If appendix B of MIL-STD-1521A (SDR) was applied, was paragraph 5.3, production feasibility assessment, of MIL-STD-1528 applied?

5. Was appendix C (PDR) or appendix D (CDR) applied to the RFP? If so was paragraph 10.2.8, production engineering analysis, of MIL-STD-499A, considered for application.

6. Was MIL-STD-1528 applicable (thresholds) and applied?

7. Were parts of MIL-STD-1528 considered and tailored and applied?

8. Was the Production Plan required by MIL-STD-1528 included as a SOW Task?

9. Was MIL-STD-1567A applicable (thresholds) and applied?

10. Were parts of MIL-STD-1567A considered, tailored and applied?

11. Was Production Surveillance and Reporting considered and applied?

IV. Source Selection Preaward Surveys and MM/PC Reviews

1. Does the SPO manufacturing activity prepare inputs to the Source Selection Plan?
2. Does the SPO manufacturing activity participate in source selection?
3. What is the SPO manufacturing activity participation in the Source Selection Evaluation Board, e.g., review of production plan, make or buy, long lead, GFP, subcontractor management, priorities, manufacturing technology?
4. Are Preaward Surveys accomplished? What is the SPO manufacturing activity participation?
5. Are MM/PC Reviews required (thresholds)? What is the SPO manufacturing activity participation?

V. Producibility of the Preliminary and Final (Critical Design Review) Design

1. What is the SPO manufacturing activity participation in the Preliminary Design Review and the Critical Design Review and specifically the producibility items of MIL-STD-1521A?
2. Are production engineering analyses (Ref. MIL-STD-499A) required of the contractor? If yes, how were they used to accomplish the producibility requirements of PDR and CDR (MIL-STD-1521A)?

VI. Manufacturing Management Systems

1. Do SPO MOA's delineate responsibilities of the SPO manufacturing activity and their interfaces with other SPO functions? Are they current and are they used?
2. Is SPO manufacturing activity familiar with the contractors manufacturing management systems, i.e., Production Control, Drawing Release, Manufacturing Planning, Material Control, etc.?
3. Is the SPO manufacturing activity conversant with the contractors plans for production and the production techniques and processes reflected in those plans?
4. How frequently does the SPO manufacturing activity visit the contractors production facility (on-the-production-floor)?

5. Does the SPO manufacturing activity participate in proposal evaluation and contract negotiation? If yes, what areas are evaluated? _____

6. Who in SPO determines reasonableness of contractors proposed man-hours in the direct (touch) labor area? _____

VII. Industrial Modernization Incentives Programs (IMIP)

1. Is the SPO manufacturing activity familiar with current policies and procedures (AFR 800-33, AFSCR 800-17)? _____

2. What is the manufacturing activities interface with the AF Materials Laboratory and the MANTECH Program? _____

3. What MANTECH projects, either generic or hardwired, are planned for your program? _____

4. Are there plans for Technology Modernization (TechMod) projects? _____

VIII. Productivity Enhancement

1. Do contractors have plans for capital investments that are directed at enhancing productivity? _____

2. What steps do you take to monitor contractors productivity enhancement initiatives and techniques? _____

3. Have you considered incentivising productivity? _____

4. Would the contractor consider additional capital investment if provisions for indemnification were provided on contract? _____

5. Were Award Fees, Performance Incentives, and/or Capital Investment Incentives considered for your program? _____

6. Are producibility studies required by contract language in addition to MIL-STD-1521A and MIL-STD-1528? _____

7. How is Work Measurement used on your program? _____

8. How is VE used on your program (Incentive, Requirement)? _____

9. Who is your VE monitor? _____

10. How often do you promote VE? _____

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